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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/509,875

06/03/2005

Klaus Peter Schwung

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EXAMINER

SYKES, ALTREV C

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/509,875	<b>Applicant(s)</b> SCHWUNG ET AL.	
	<b>Examiner</b> ALTREV C. SYKES	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.  
4a) Of the above claim(s) 6-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 12-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20041001</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-5 and 12-16 in the reply filed on May 15, 2008 is acknowledged. Claims 6-11 of Group II are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.
2. The traversal is on the ground(s) that the alleged special technical feature of the claims of Group I, required a proportion of polyphenylene sulfide relative to uncoated reinforcing fibers of "0.002 to 0.009" percent by weight. This is incorrect, as claim 1 of the present application clearly requires this proportion to be "0.001 to 0.01" percent by weight. Examiner agrees with applicant about the special technical feature of Group I.
3. Further applicant argues that the defined special technical feature of Group I above is identically recited in step b) of claim 6 of Group II. Additionally, the pretreatment of claim 6 is recited to be optional and does not specifically have to be electrochemical pretreatment. As such, examiner finds applicant's arguments directed to the shared special technical feature to be persuasive. However, "A group of inventions is considered linked to form a single general inventive concept where there is a technical relationship among the inventions that involves at least one common or corresponding special technical feature. The expression special technical features is defined as meaning those technical features that define the contribution which each claimed invention, considered as a whole, makes over the prior art." MPEP 1893.03(d) As such, and as evidenced by Shue et al. (US 4,489,129) there is not a contribution over the prior art for

the recited single inventive concept as acknowledged by Applicant. Additionally, the examiner notes that there is more involved in examining a patent application besides searching, such as formulating rejections and evaluating applicant's arguments.

4. The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-5 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. Regarding claims 1-5 and 12, examiner notes the recitation of the proportion of polyphenylene sulfide relative to the uncoated reinforcing fibers is 0.001 to <0.01 wt.% in [0005] and [0007] only. However, applicant also discloses the PPS proportion, in the reinforcing fiber can be adjusted by adjusting the PPS concentration in the bath through which the reinforcing fibers pass at the prescribed speed, such that the coated reinforcing fibers contain 0.001 to <0.01 wt.% of PPS. Additionally, it is noted that in Example 1 the proportion of PPS relative to the carbon fibers is 0.009 wt.%. (See [0035]) As such, it is unclear to the examiner whether a portion of each fiber is uncoated completely or whether the entire fiber is coated but the coating contains the small portion of 0.001 to <0.01 wt.% of PPS rendering the fiber body uncoated relative to just the PPS. To the extent the claims are understood, the claims are interpreted at this time for examination

purposes to mean that the fibers are all completely coated by a reinforcing resin containing the recited amount of PPS.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
10. Claims 1-5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shue et al. (US 4,489,129) in view of Harris (US 4,910,289).

Regarding claims 1 and 2, Shue et al. discloses reinforcements are treated with a curable polymer such as, for example, poly(phenylene sulfide) and then subjected to conditions sufficient to cure the polymer. (See Col 1, lines 49-52) The reinforcements produced in this manner can be incorporated into a plastic and include carbon, glass, boron, silica, quartz, asbestos, mica and organic material. (See Col 1, lines 52-56 and 64-68) The amount of polymer coating on the reinforcement after curing can vary widely. It

is contemplated that for most purposes the weight percentage of polymer coating will range from about 0.1 to 10 weight percent. (Col 3, lines 20-24) Shue et al. discloses all of the claim limitations as set forth above but the reference does not specifically disclose wherein a proportion of polyphenylene sulfide relative to uncoated reinforcing fibers is 0.001 to <0.01 percent by weight.

Harris discloses miscible poly(aryl ether ketone) blends possessing increased crystallization rates. The composition contains (a) from about 98 to 99.9 percent by weight of a miscible poly(aryl ether ketone) blend, and (b) from about 0.1 to about 2 percent by weight of a poly(phenylene sulfide) or a copolymer thereof. (See Col 1, lines 7-12) Further, the compositions may contain (a) from about 98 to 99.9 percent by weight of a miscible poly(aryl ether ketone) blend with a polyetherimide, certain poly(amide-imides) and/or polyimides and (b) from about 0.1 to about 2.0 percent by weight of poly(phenylene sulfide) or a copolymer thereof. (See Col 4, lines 9-15) Harris also discloses that the discovery that such small amounts of the additive (< 2 weight percent) are effective in promoting fast crystallization rates was totally unexpected. (See Col 4, lines 15-19) The compositions may also include mineral fillers as well as reinforcing fibers such as fiberglass, carbon fibers, and the like. (See Col 22, lines 35-40)

As Shue et al. and Harris are both directed to coatings containing polyphenylene sulfide and reinforcing fibers, the art is analogous. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the coating composition of Harris in place of the coating composition as disclosed by Shue et al. for the added benefit of a faster crystallization which would give a final product made with

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the compositions excellent mechanical properties as well as excellent chemical and heat resistance. (See Col 1, lines 15-18)

Further regarding claims 1 and 2, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the percent of polyphenylene sulfide since it has been held that, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). The burden is upon the Applicant to demonstrate that the claimed amount of polyphenylene sulfide is critical and has unexpected results. In the present invention, one would have been motivated to optimize the polyphenylene sulfide motivated by the desire to optimize the crystallization rates as Harris discloses that less than 2 weight percent is highly effective. (See Col 4, lines 15-18) This is important because in order to achieve optimum properties the crystallinity of the materials needs to be developed as fast as possible during the fabrication process. (See Col 3, lines 18-20) It would have also been obvious to one of ordinary skill in the art to utilize the lesser amount of PPS to save materials and cut costs.

Regarding claims 3-5 and 12, modified Shue et al. discloses all of the claim limitations as set forth above.

Additionally, modified Shue et al. discloses a composite material:

- wherein the coating comprises polyphenylene sulfide and a thermoplastic material. (See Col 4, lines 9-15, wherein poly(aryl ether ketone) is a thermoplastic material)

- the reinforcing resin is a thermoplastic or a mixture of thermoplastics. (See Col 4, lines 9-15)
- wherein the reinforcing fibers are carbon fibers, fiberglass, and the like. (See Col 22, lines 36-39)
- Components for aircraft construction, automobile construction, machine construction or plant construction, and medical components, comprised of the composite material as set forth above. (See Col 22, lines 42-46 wherein the blends may be fabricated into any desired shape and are particularly desirable for use as electrical insulation for electrical conductors.)

11. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris (US 4,910,289).

Regarding claims 13 and 14, Harris discloses miscible poly(aryl ether ketone) blends possessing increased crystallization rates. The composition contains (a) from about 98 to 99.9 percent by weight of a miscible poly(aryl ether ketone) blend, and (b) from about 0.1 to about 2 percent by weight of a poly(phenylene sulfide) or a copolymer thereof. (See Col 1, lines 7-12) Further, the compositions may contain (a) from about 98 to 99.9 percent by weight of a miscible poly(aryl ether ketone) blend with a polyetherimide, certain poly(amide-imides) and/or polyimides and (b) from about 0.1 to about 2.0 percent by weight of poly(phenylene sulfide) or a copolymer thereof. (See Col 4, lines 9-15) Harris also discloses that the discovery that such small amounts of the



additive (< 2 weight percent) are effective in promoting fast crystallization rates was totally unexpected. (See Col 4, lines 15-19) The compositions may also include mineral fillers as well as reinforcing fibers such as fiberglass, carbon fibers, and the like. (See Col 22, lines 35-40)

Further regarding claims 13 and 14, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the percent of polyphenylene sulfide since it has been held that, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). The burden is upon the Applicant to demonstrate that the claimed amount of polyphenylene sulfide is critical and has unexpected results. In the present invention, one would have been motivated to optimize the polyphenylene sulfide motivated by the desire to optimize the crystallization rates as Harris discloses that less than 2 weight percent is highly effective. (See Col 4, lines 15-18) This is important because in order to achieve optimum properties the crystallinity of the materials needs to be developed as fast as possible during the fabrication process. (See Col 3, lines 18-20) It would have also been obvious to one of ordinary skill in the art to utilize the lesser amount of PPS to save materials and cut costs.

Regarding claims 15-16, Harris discloses reinforcing fibers wherein:

- wherein the coating comprises polyphenylene sulfide and a thermoplastic material. (See Col 4, lines 9-15, wherein poly(aryl ether ketone) is a thermoplastic material)

- wherein the reinforcing fibers are carbon fibers, fiberglass, and the like.  
(See Col 22, lines 36-39)

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### ***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALTREV C. SYKES whose telephone number is (571)270-3162. The examiner can normally be reached on Monday-Thursday, 8AM-5PM EST, alt Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1254. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ACS/  
6/18/08

/Carol Chaney/  
Supervisory Patent Examiner, Art Unit 1794